

Doughnut Wart Following Salicylic Acid Application: A Rare Case Report

Sir,

Viral warts are benign proliferative cutaneous and mucous membranous lesions caused by human papillomavirus (HPV) affecting 7%–10% of general population.^[1] The “Doughnut wart” or “ring wart” or “annular wart” is an unexpected and unusual presentation occurring in the course of wart treatment. We report a case of doughnut wart which developed following treatment of the preexisting wart with topical salicylic acid which is a rare and unique finding.

A seven-year-old girl with two warts over the left index finger was treated with topical Salicylic acid 17% liquid. The liquid was applied over warts and the site was occluded with micropore tape. Two days later she developed maceration and superficial erosion on and around warts with slight flattening of warts as observed by the parents. The application of liquid without occlusion was continued for one month. One month later, the child developed annular warty lesions around the preexisting warts giving appearance of a doughnut.

On examination, there were centrally placed two verrucous lesions of approximate size 4 × 4 mm each, with irregular border, surrounded by another verrucous ring of approximate size 10 × 10 mm with well-defined border over dorsum of the left index finger [Figure 1]. The surface of both the central warty lesions and peripheral rings were rough and verrucous with pinpoint hemorrhagic spots. The lesions were firm in consistency, normal skin-colored and in between the two rings skin was apparently normal.

Dermoscopy of the lesion using DermLite DL4 under contact mode revealed presence of multiple papillae containing central red

dot surrounded by whitish halos assuming a frogspawn appearance [Figure 2]. Based on clinical and dermoscopic findings, we diagnosed the case as doughnut wart. The child is being treated with a combination of oral zinc sulfate (10 mg/kg/day) and topical tretinoin (0.05%).

A typical common wart presents as solitary, exophytic, hyperkeratotic papule, or plaque with regular to irregular border especially located on fingers, hands, knees, elbows, or any other sites of trauma.^[2] Presentation may be in form of plane or flat wart, plantar wart, myrmecia wart, filiform wart, mosaic wart, periungual wart, or anogenital wart.^[3]

A “doughnut wart” or “ring wart” or “annular wart” is a rare and unexplained complication of wart treatment. It has been reported after treatment of primary wart with destructive physical or chemical modalities such as cantharidin and cryotherapy. Typically it presents as a peripheral ring of exuberant new wart around a preexisting wart or a wart with central clearing and annular recurrence.^[2,4]

The exact mechanism behind the development of doughnut wart is still unknown. Some authors claimed that it represents an intra-epidermal autoinoculation of the virus through the blister cavity developed following destructive modalities such as cantharidin and cryotherapy.^[4,5] In our case, salicylic acid was the possible cause of the occurrence of doughnut wart. We assume that the possible mechanism behind the development of peripheral wart around the margin of preexisting warts could be due to seeding of the virus to the surrounding tissue which is more likely due to pseudo-koebnerization phenomenon or a failure to treat the subclinical marginal infected tissues or could be due to the

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Access this article online

Website: www.idoj.in

DOI: 10.4103/idoj.IDOJ_415_20

Quick Response Code:



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How to cite this article: Sethy M, Srinivas CR, Krishna V, Chadlavada P. Doughnut wart following salicylic acid application: A rare case report. *Indian Dermatol Online J* 2021;12:451-3.

Received: 31-May-2020. **Revised:** 03-Jul-2020.

Accepted: 04-Aug-2020. **Published:** 12-May-2021.



Figure 1: Presence of a ring of warty lesions around the centrally placed verrucae

Koebner phenomenon, which is a latent activation of potentially infected cells by trauma that is salicylic acid application. The persistence of central wart could be because of inappropriate application of salicylic acid liquid by the patient.

Diagnosis of doughnut wart is mainly based on clinical features. However, dermoscopy which is a recent non-invasive procedure can be used for confirmation of diagnosis. Dermoscopic features of wart include presence of grouped papillae, with dotted or loop vessels, and/or hemorrhagic points surrounded by whitish halos and irregularly distributed blackheads giving a frogspawn appearance.^[6] In our case also, multiple papillae with central red dots surrounded by whitish halo and discrete black dots were seen suggesting a frogspawn appearance.

Around 40–60% of common warts resolve spontaneously in immune-competent patients within 2 years; however, the remaining 40–60% may require medical or surgical intervention.^[7,8] Among the huge armamentarium of wart treatment, topical salicylic acid finds the top place and is the first choice of therapy by dermatologists as it is inexpensive, with fewer side effects, minimal pain associated with treatment, reasonable effectiveness, and convenience of application. It acts as a keratolytic and destroys virus-infected epidermis reducing cohesion between corneocytes and may cause an immune response.^[9] Concentrations of salicylic acid available ranges from 10% to 60%.^[10] It is available as 17% salicylic acid liquid preparation in a base of flexible collodion or as a 40% salicylic acid plaster patch.^[11] In our case, the patient had applied salicylic acid 17% solution which was believed to be the reason behind doughnut morphology.

Because the occurrence of doughnut wart is extremely rare, no definite lines of therapy have been suggested for the treatment of this entity. However, Nofal & Fouda *et al.* successfully treated doughnut wart with intralesional injection of candida antigen at a dose



Figure 2: Dermoscopy of the lesion under contact mode using DermLite DL4 showing the presence of multiple dense papillae containing central red dot surrounded by whitish halos giving a frogspawn appearance. (Magnification ×10)

of 0.2 ml until complete clearance of lesion or for a maximum of 5 sessions^[12] and, Hood and Miller reported complete resolution of a ring wart after treatment with oral diindolylmethane (DIM) at a dose of 6 mg/kg for 4 months.^[4] To prevent the occurrence of doughnut wart, Hood and Miller^[4] suggested a wider application of the topical therapy, combination of topical and oral therapies, or a complete switch to a more invasive treatment and Yoo *et al.*^[13] suggested immune response modifiers with potent antiviral activities to be used in combination with cryotherapy. In our case, we decided not to further damage the lesion with destructive modalities and preferred to treat with oral zinc sulfate at a dose of 10 mg/kg/day and topical tretinoin (0.05%).

Conclusion

Though doughnut wart mostly encountered after treatment of wart with destructive modalities like cantharidin and cryotherapy, this may occur with the use of various other treatment modalities also. To our knowledge, this is the first report where doughnut wart developed following treatment with topical salicylic acid which is a unique finding. We report this case because of the peculiar morphology of the lesion and rarity. Further observation of such finding may help in better understanding of the mechanism behind the development of such clinical entity.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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